

MODULE 21: ANIMALS' FITNESS TO TRAVEL



NATIONAL VETERINARY ACCREDITATION PROGRAM

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Approved as one unit of supplemental training for participants in USDA's National Veterinary Accreditation Program



Animals' Fitness to Travel

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Animals' Fitness to Travel

Introduction

One of the many roles of an accredited veterinarian is to evaluate livestock before they are transported commercially, to a sales venue, or to slaughter. This module describes how to assess an animal's fitness to travel and explains the appropriate action that should be taken for animals that are found unfit for transport. This module also discusses suggestions that can be made to the livestock producer to enhance the general well-being of animals during transport.

After completion of this module you will be able to:

- Discuss the role of the accredited veterinarian when evaluating the fitness of an animal to travel;
- Describe how to perform an inspection or examination of an animal to determine if it is able to be transported; and
- Explain steps that can be taken to make livestock transportation more comfortable and safe for animals.

Species Covered

This module will address these livestock species in the following order:

- Bovine – Divided between beef and dairy where appropriate
- Small Ruminants – Specifically goats and sheep
- Swine
- Equine

Specific details related to horses moving to slaughter can be found in the Code of Federal Regulations (CFR), title 9, part 88 (Commercial Transportation of Equines for Slaughter) as well as examples in another National Veterinary Accreditation Program (NVAP) module titled, "Module 20: Slaughter Horse Transport." Poultry and aquaculture details can be found in other NVAP modules.

Livestock Transportation

Every day, tens of thousands of pigs, cattle, sheep, goats and horses are loaded onto trailers and transported between or within states, sometimes just down the road. Some animals are loaded onto trucks, ships or airplanes and transported internationally. The travel distance, species, and reasons for travel are multiple and varied. Likewise, the animal movement forms that accompany livestock will vary. The commonality is that the animals loaded for transport should be assessed and determined to be fit to travel.

There are a number of physical or disease conditions that prevent an animal from being humanely transported to its proposed destination. It is important to understand that the animal's physical condition may limit its possible destinations but does not always preclude all travel. For example, a cow that suffers from a displaced abomasum should not be sent to an auction; however, that animal may travel to slaughter if she remains ambulatory*. The appropriate travel options will be stated with each physical condition presented later in this module.

*Ambulatory animals must be able to walk under their own power.

Veterinary Vigilance

Accredited veterinarians are uniquely qualified to perform inspections and examinations on livestock prior to their transport. A veterinarian's training in normal and abnormal conditions allows them to recognize subtle signs of an infectious disease or other conditions that could affect the health or well-being of the animals transported in close contact.



An **inspection** is defined under 9CFR160.1 as the “visual study of the physical appearance, physical condition, and behavior of animals (singly or in groups) that enables an accredited veterinarian to determine whether any abnormality in physical condition or bodily function is evident”. If an abnormality is identified, the veterinarian shall perform an **examination** which is also defined under 9CFR160.1 as the “physical study of an individual animal to determine if an abnormality in physical condition or bodily function is suggestive of clinical signs of communicable disease.”

A proper inspection or examination accomplishes the following:

- Prevents the spread of contagious*, infectious**, or communicable*** diseases
- Enhances the objectivity and repeatability among veterinarians in evaluating an animal’s fitness to travel
- Shines a positive light on the livestock industry, as only healthy animals walk off the trailer at their destination
- Positively affects the welfare of livestock by preventing animals with questionable health or physical conditions from enduring the stresses of travel

*Contagious refers to a disease capable of being transmitted from animal to animal.

**Infectious diseases are due to organisms that are contagious, nosocomial, or due to endogenous microflora; also referred to as communicable diseases.

***Communicable diseases can pass or be carried from one animal to another directly or indirectly (fomites and vectors).



Physical Attributes of the Animal

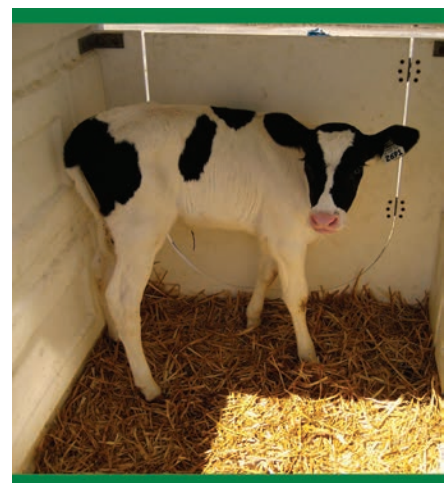
The following sections will cover numerous physical attributes of livestock that should be considered when assessing an animal’s fitness to travel:

- Age – An overview of the appropriate age to transport livestock
- Production stage – A discussion of the animal care needs for lactating, gestating, and wool- or mohair-producing animals
- Sight – Visual impairments that will cause unsafe transportation conditions for both the livestock and animal caretakers
- Overall condition – Adequate for the stamina required for humane travel

Age Recommendations

The transport of young livestock can potentially be detrimental to their health. However, following the guidelines presented below should help to minimize some of the stressors that travel can impose upon juveniles.

Bovine–dairy: Newborn calves should only be transported once they have a dry navel and can walk without assistance. If transported before the navel is dry, ensure the calf is completely dry, their navels have been dipped or sprayed with a drying agent/antiseptic to decrease pathogen entry, ensure they are ambulatory and transported in a well-bedded, appropriately ventilated yet draft free trailer with adequate space to allow sternal recumbency for each calf. Calves require special care during transport to ensure they do not become too cold (environmental temperatures below 60°F/15.6°C) and remain dry. A wet calf has the same effect as the outdoor temperature dropping 40-50°F (4-10°C). Clean straw bedding and plugging air holes in the trailer may be necessary in certain climates/times of year.



Source:

- Grandin, Temple and American Meat Institute Animal Welfare Committee. *Recommended Animal Handling Guidelines and Audit Guide: A Systematic Approach to Animal Welfare*. American Meat Institute. 2010;6-7. <http://www.animalhandling.org/ht/a/GetDocumentAction/i/63215>

Bovine—beef: Research has shown that weaned calves that are acclimated to a solid diet (hay, pasture, grain) have fewer health issues upon reaching their transportation destination.

Sources:

- Arthington JD, Eicher D, Kunkle WE, et al. *Effect of transportation and commingling on the acute-phase protein response, growth, and feed intake of newly weaned beef calves.* Journal of Animal Science 2003;81:1120-1125
- MacKenzie AM, Drennan M, Rowan TG, et al. *Effect of transportation and weaning on humoral immune responses of calves.* Research in Veterinary Science 1997;63:227-230
- Stanger KJ, Ketheesan N, Parker AJ, et al. *The effect of transportation on the immune status of Bos indicus steers.* Journal of Animal Science 2005;83:2632-2636.

Small Ruminants: Kid goats and lambs should have a dry navel and be able to walk unassisted before being transported for sale. The transport of young kid goats in dog crates on airplanes has become very common. This practice of transportation must be done at an age which will allow the goat to comfortably fit inside a dog crate.

Swine: Newly weaned piglets (12 -28 days of age) are commonly moved to a nursery or finishing facility. When moving piglets of this age, pay special attention to using appropriate transportation equipment, and ensuring pig comfort and hydration status.

Equine: Suckling foals should be transported with their dam in a compartment separate from other animals.



Transport Considerations for Various Production Stages

Animals in various production stages require special accommodations when being transported. These provisions make movement more humane and may prevent the animals' death.

Lactating Ruminants

Ruminants that are being milked and will be culled from the herd should be dried off before being sent to a sale or an auction. If they cannot be dried off before transport then these cull animals should be milked immediately before being transported. It is recommended that lactating ruminants be milked prior to extensive transportation which may cause them udder discomfort.

Thick-Coated Animals

Angora and cashmere goats, sheep, and alpacas are raised for their ability to grow long hair coats that are often sheared during the spring and/or fall. When transporting unshorn animals in hot climates for long periods of time, it is important not to overcrowd the trailer. Transporters should also ensure that there is appropriate air flow throughout the trailer. If possible, travel should occur during periods of the day that are most accommodating to the comfort of the livestock.

Pregnancy and Parturition Recommendations

Transporting an animal that is displaying late stage signs of pregnancy (described below) can cause abortion or premature labor. These animals should be physically examined before undergoing transportation. If movement is necessary, ensure these animals travel in well-bedded trailers with adequate space that allows each animal to lie down comfortably.

- Bovine: Cows with a full udder and relaxation or “springing” of the vulva.
- Small Ruminants: Goats and sheep will develop a full udder and display a bloody vaginal discharge when parturition is near.
- Swine: Sows late in gestation will develop a full udder and their vulva will start to swell.
- Equine: Mares with relaxation of the vulva, a full udder, or wax-like beading of the teats.



A pregnant animal experiencing dystocia may require transportation to a veterinary facility for assistance or caesarian section in a safer, more sterile environment than found on farm. Minimize transportation stress on the animal and fetus by transporting them alone in a compartment in a well-bedded trailer. Animals should not be transported for slaughter, or sale, until at least 48 hours following parturition. USDA Food Safety Inspection Service (FSIS) requirements regarding presentation of parturient livestock for slaughter are outlined in 9CFR309.10, Onset of parturition: “Any livestock showing signs of the onset of parturition shall be withheld from slaughter until after parturition and passage of the placenta. Slaughter or other disposition may then be permitted if the animal is otherwise acceptable.”

Evaluation of Sight Prior to Travel

Veterinarians can use a number of methods to determine if an animal has the ability to see, referred to as a clinical blindness test. The standard menace test is most often used. This involves bringing one’s hand close to the eye of the patient with a quick motion. Theoretically, if the animal is still able to see, it should blink and move its head away from the hand. However, this may not be the most accurate test, as a blind animal will often respond to the air movement created by the hand motion rather than to physically seeing the hand. Therefore one should begin movement towards the eye with a pointed finger or soft object, such as folded gauze, to reduce air currents.

The pupillary light reflex can be used to help determine the anatomic location of a visual deficiency. This involves shining a penlight into the suspected injured eye and watching both eyes for pupillary constriction. In most animals, the eye being evaluated will show greater pupillary constriction as compared to the contralateral eye. However, a positive pupillary light reflex is not a reliable indicator of vision or retinal function.

Vision is often accurately assessed by observing the animal’s behavior and analyzing its history. Observing an animal’s behavior to objects in an unfamiliar environment can also be helpful in determining an animal’s ability to see, though care should be taken to prevent the animal from harming itself. FSIS veterinarians evaluate animals for signs of central blindness versus peripheral blindness. FSIS would consider a central blindness with other central nervous system signs as a basis for condemnation.

Source:

- Maggs, David J., Paul E. Miller, and Ron Ofri. *Slatter’s Fundamentals of Veterinary Ophthalmology. 4th ed. St. Louis: Saunders Elsevier, 2008. 85-102. Print.*

Visual Impairment

Livestock that are blind in both eyes are at risk for injury if transported in crowded conditions without additional precautions. They can be transported to slaughter if physical accommodations are made to ensure they do not pose a danger to themselves or the handlers during the transport process.

Animals suffering from blindness in one eye should be closely monitored. If it appears that the animal is losing sight in the other eye, it is recommended that the animal be transported to slaughter as soon as possible. When feasible, visually impaired animals should travel with a quiet, familiar animal of the same size and species.

Bovine ocular squamous cell carcinoma (cancer eye) is a common form of cancer in cattle. It is characterized by a pink fleshy growth from the eyeball (pictured right), eyelid, or third eyelid. This condition is commonly seen in cattle that are older than five years of age, especially cattle with un-pigmented skin around the eyes. If the growth extends beyond the orbit of the eye, the animal should be euthanized on the farm. However, if the cancer is contained within the orbit, then the animal should be sent to slaughter as soon as possible.



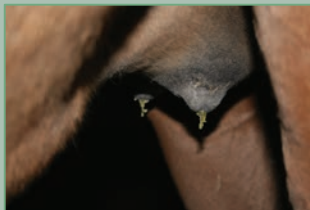
FSIS outlines disposition requirements for epithelioma in 9CFR309.6, Epithelioma of the eye: “Any animal found on ante-mortem inspection to be affected with epithelioma of the eye and the orbital region in which the eye has been destroyed or obscured by neoplastic tissue and which shows extensive infection, suppuration, and necrosis, usually accompanied with foul odor, or any animal affected with epithelioma of the eye or of the orbital region which, regardless of extent, is accompanied with cachexia shall be identified as U.S. Condemned and disposed of in accordance with Sec. 309.13.”

Knowledge Review #1

Based on the photographs, select the pregnant animal that would be considered ‘fit to travel’ if she had no other abnormalities.



A. Springing heifer



B. Waxing udder on a mare



C. Goat with a newborn kid



D. A sow that is less than 50 days bred

Answers are found in the appendix.

Importance of Body Condition Evaluation

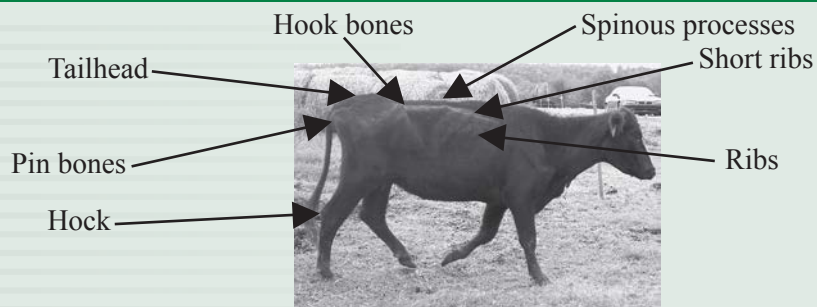
It is important to consider the animal’s body condition when assessing an animal’s ability to undergo transportation. This evaluation will yield valuable information about the overall health of the animal. Animals that are extremely thin are of special concern. Emaciation in animals is generally caused by stress, illness, parasites, gastrointestinal issues, poor dentition, or restricted feed intake. Emaciated animals lack body fat which helps sustain and protect the animal through transportation. Without energy stores and cushioning, animals are likely to collapse and/or become injured during transportation. This trauma may lead to the animal being unable to walk off of the trailer. FSIS inspectors condemn any non-ambulatory disabled (NAD)* beef animals presented for slaughter.

*NAD is defined in 9CFR309.2(b) as "livestock that cannot rise from a recumbent position or that cannot walk, including, but not limited to, those with broken appendages, severed tendons or ligaments, nerve paralysis, fractured vertebral column, or metabolic conditions".

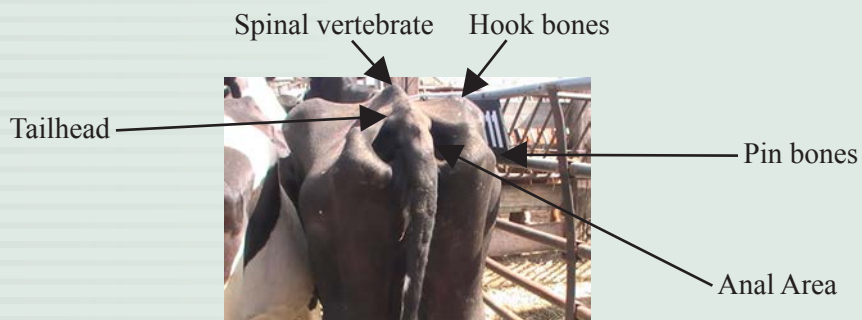
Obese animals are also a concern as they will overheat more quickly than animals with appropriate body conditions, so care should be taken not to overcrowd these animals and to allow for appropriate ventilation.

Body Condition Evaluation Ranges

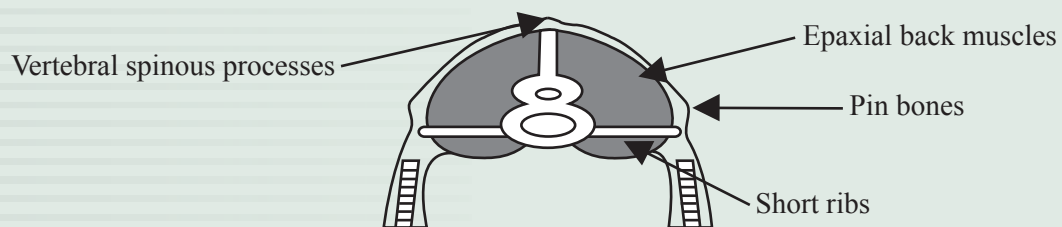
Below you will find various body condition evaluations for livestock. Each evaluation contains a range of scores (referred to as body condition score or BCS), as well as animal condition descriptions for each corresponding score. As a general introduction, the BCS number range varies by species, but they all depend on fat cover over specific anatomical locations. Beef cattle and equine are scored 1 through 9, with 1 being emaciated and 9 extremely fat. Dairy cattle, small ruminants, and swine are scored 1 through 5, with one being emaciated and 5 being fat (dairy), obese (sm. rum), or overly fat (swine). Example photos or diagrams with labeled anatomical parts are provided for review.



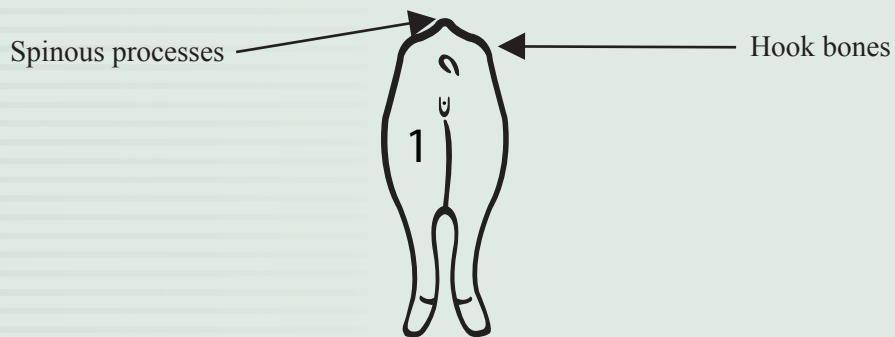
Beef Cattle



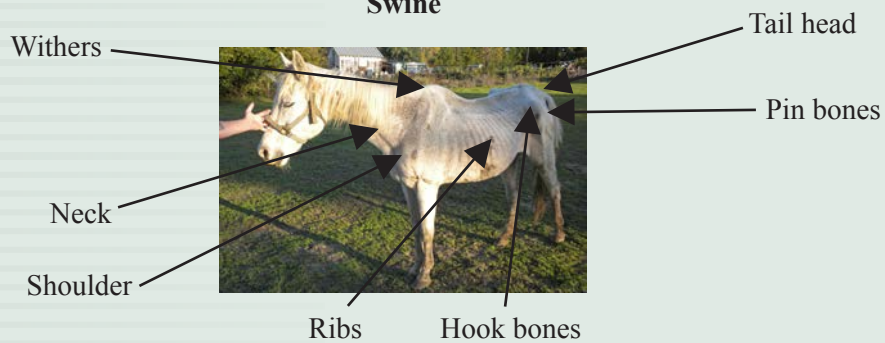
Dairy Cattle



Small Ruminants



Swine



Equine

Beef Cattle Body Condition Scores (BCS) Range from 1 to 9



1. Emaciated

There is no palpable fat over the spinous processes, short ribs (transverse processes of lumbar vertebrae), ribs, and hook and pin bones. The tailhead, ribs, and vulva are prominent with a depressed anal area. Considered unfit to travel.



2. Poor

The animal still lacks fat over the spinous processes and hook and pin bones. However, the tail head, ribs, and anal area are less prominent.



3. Thin

Individual ribs are still noticeable though not sharp to the touch. Fat is able to be palpated around the tailhead and spinous processes. There is a thin layer of backfat over the ribs close to the vertebrae.



4. Borderline

Individual spinous processes are palpable but not sharp to the touch. Ribs may or may not be individually distinguishable. Some fat is present over the ribs, short ribs, and hook bones.



5. Moderate

Fat cover is palpable on either side of the tailhead. Fat over the ribs feels spongy. Overall, the animal has a lean and fit appearance.



6. High Moderate

The animal has a moderate amount of fat over the ribs and around the tailhead. Firm palpation is needed to feel the individual spinous processes of the vertebrae.



7. Good

The animal displays considerable fat cover. Palpable fat over the ribs and around the tailhead is spongy. Deposits of fat are beginning to form around the tailhead.



8. Fat

Palpation of the spinous processes is not possible. Large fat deposits are present over the ribs and around the tailhead. There is a large amount of fat between the pin bone and tailhead, also referred to as a “fat pone” or “round”.



9. Extremely Fat

The tailhead and hocks are covered in fatty tissue with excessive fat between the pin and tailhead. Bone structures are no longer visible or palpable. The animals appear to be very blocky, and fat deposits may be so severe that they impair their mobility.

Source:

- Parish J, Rhinehart J. *Body Condition Scoring Beef Cattle: Mississippi State University Extension Service, 2008.*
<http://msucares.com/pubs/publications/p2508.pdf>

Dairy Cattle BCS Range from 1 to 5



1. Emaciated

The individual vertebrae of the spine are prominent. The short ribs are sharp to the touch and give a shelf-like appearance to the loin. The hook and pin bones of the pelvis are well defined. The anal area of the cow is receded displaying a prominent vulva. Considered unfit to travel.



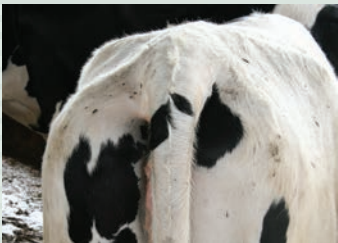
2. Thin

The short ribs can be felt but are less outstanding. The hook and pin bones are still well-defined, though the area around the anus is less sunken and the vulva is prominent.



3. Average

The short ribs are palpable with slight pressure. There is no shelf-like appearance to this area. The spine and hook and pin bones are all rounded and smoothed over. The anal area is filled out, and there is no evidence of fat deposits.



4. Heavy

The short ribs are rounded over with no evidence of a shelf-like appearance and may only be felt with firm palpation. The ridge of the backbone is flattened over the loin and rump areas. The hook bones are smoothed over and the area around the pin bones shows some fat deposits.



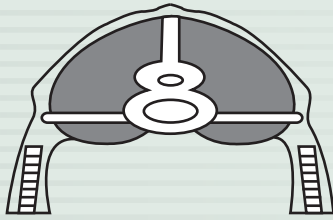
5. Fat

The bone structures of the spine, hook and pin bones, and short ribs are not discernible. There are fat deposits around the tailhead and over ribs. The thighs curve out and the brisket and flanks appear to be very full and heavy.

Source:

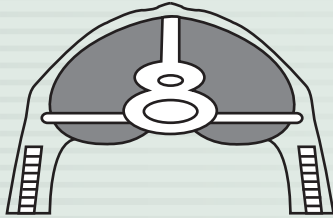
- *Body Condition Scoring of Dairy Cattle: Factsheet: Ontario Ministry of Agriculture Food and Rural Affairs, 2010.*
<http://www.omafra.gov.on.ca/english/livestock/dairy/facts/00-109.htm>

Small Ruminants BCS Range from 1 to 5



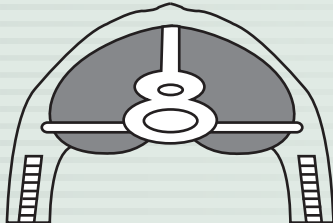
1. Emaciated

The vertebral spinous processes are sharp and easily palpated. Epaxial back muscles have no fat cover. Short ribs are sharp to the touch and one is able to pass a hand underneath the ends of the processes. Considered unfit to travel.



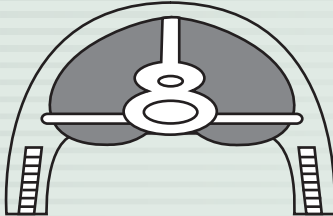
2. Thin

Vertebral spinous processes are still prominent. The epaxial back muscles have no fat cover but are more fully developed. The short ribs are slightly smoothed over, though it is still possible to palpate under the processes.



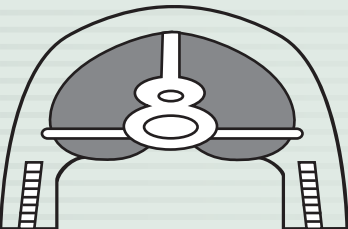
3. Average

The spinous processes are smooth and rounded over, though one can still feel individual processes if pressure is applied. Short ribs are also smooth and well covered, and firm pressure is needed to feel the ends of the processes. The epaxial back muscles are fully developed with a slight covering of fat.



4. Fat

The spinous processes are able to be detected as a hard line only if firm pressure is applied. Transverse processes are not able to be palpated. The epaxial back muscles are well developed with a thick covering of fat.



5. Obese

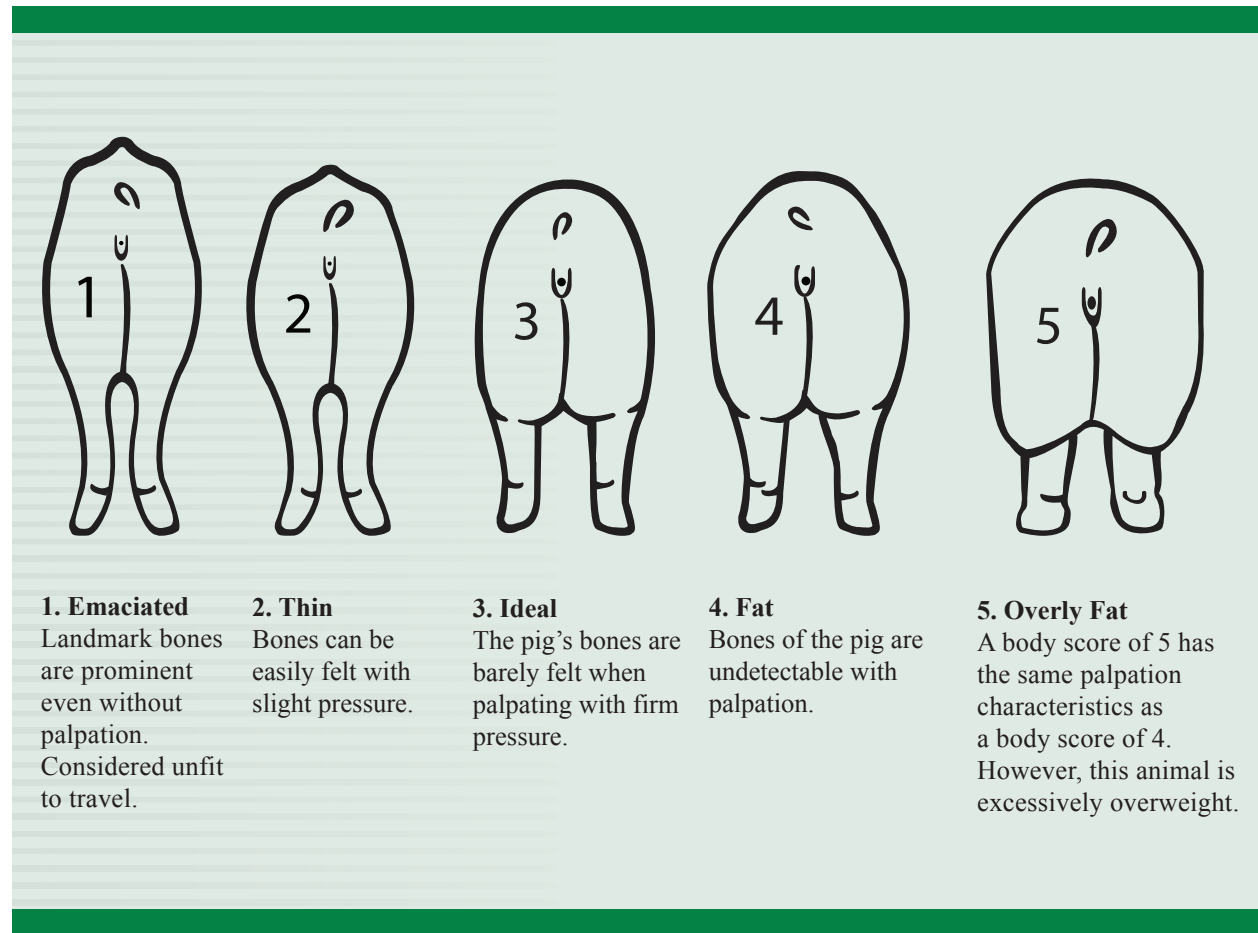
Spinous processes are unable to be detected, and there is a depression between fat where the spinous processes would normally be palpated. Transverse processes are unable to be felt. The epaxial back muscles are developed with a very thick covering of fat.

Sources:

- Spahr L. *Body Condition Scoring in Meat Goats: Penn State University Cooperative Extension, Bedford County, 2009.*
<http://bedford.extension.psu.edu/agriculture/goat/Body%20Condition%20Scoring.htm>
- Thompson J, Meyer H. *Body Condition Scoring of Sheep: Oregon State University Extension Service, 1994.*
<http://ir.library.oregonstate.edu/jspui/bitstream/1957/14303/1/ec1433.pdf>

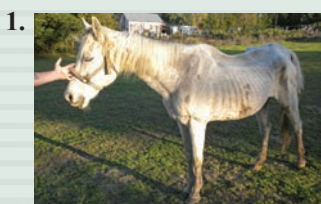
Swine BCS Range from 1 to 5

The body condition of swine is most accurately determined by the palpation of bony landmarks, such as the ribs, spinous processes of the vertebrae, “H bones” (hook bones), and pin bones.



Source:

- Coffey R, Parker G, Laurent K. Assessing Sow Body Condition: University of Kentucky College of Agriculture Cooperative Extension Service, 1999. <http://www.ca.uky.edu/agc/pubs/asc/asc158/asc158.pdf>



1. Emaciated

The spinous processes of the vertebrae, ribs, tailhead, and hook and pin bones are all prominently seen. The bones of the withers, shoulders, and neck are also easily identified, and no fat is palpable anywhere. Considered unfit to travel.

2. Very Thin

The vertebral spinous processes are prominently seen, as well as the ribs, tailhead, and hook and pin bones. The bone structures of the withers, neck and shoulders are still fairly noticeable.



3. Thin

The spinous processes are still outstanding; however, their lower halves are covered by fat. The individual vertebrae are not distinguishable. A very thin layer of fat can be felt over the ribs. The tailhead is prominent; however, the pin bones are not visible. Hook bones are visible but rounded. The withers, shoulders, and neck are all accentuated.

4. Moderately Thin

The horse's spinous processes create a negative crease along the back. The rib outlines are faintly seen. Hook bones are not visible, and the withers, neck, and shoulders are not obviously thin. Fat can be felt around the tailhead.



5. Moderate

The spine of the horse is level with surrounding muscle height. Ribs are not visible but are easily felt. The fat palpable around the tailhead feels slightly spongy. The withers appear rounded with the neck and shoulder blending smoothly into the body.

6. Moderately Fleshy

There is fat around the tailhead that feels soft, whereas fat over the ribs feels spongy. There are small fat deposits along the sides of the withers, behind the shoulders, and along the sides of the neck. There might be a slight crease down the back of the horse.



7. Fleshy

Fat is noticeable within the withers, neck, and behind the shoulders. The horse's ribs can be felt, but there is noticeable fat between individual ribs. Fat around the tailhead is soft. There may also be a crease down the back of the horse.

8. Fat

The horse has a crease down the back. Spaces between the ribs are so filled with fat that the ribs are difficult to feel. The area along the withers and tailhead are filled with fat, though fat around the tailhead is very soft. The space behind the shoulders is filled in flush. There is some fat deposited along the inner buttocks.



9. Extremely Fat

The back crease is very obvious, with fat appearing in patches over the ribs. There is bulging fat around the tailhead, withers, shoulders, and neck. The inner buttocks may be rubbing together due to excessive fat. The flank will be filled-in flush.

Source:

- Henneke D, Potter G, Kreider J, et al. Relationship Between Condition Score, Physical Measurements and Body-Fat Percentage in Mares. Suffolk, England: Equine Veterinary Journal, 1983;371-372.

Eligibility for Transport Based Upon Body Condition

Any animal that exhibits a body condition score of one (1) is unfit for travel. This emaciated condition may be a sign of serious illness and should result in immediate treatment or euthanasia. Following treatment and recovery, the animal's body condition should be re-assessed to determine if the animal is fit for transport. If the animal's condition fails to improve it should be euthanized on the farm.

Livestock that are emaciated due to reduced feed intake should be gradually fed toward a healthy body condition before transport. Again, if their body condition fails to improve past a score of one, euthanasia is the most humane option.

Knowledge Review #2

Based on the photographs, select the animal(s) that would NOT be considered 'fit for travel' based on body condition score (BCS). Select ALL that apply.



A. Horse with BCS 1 (emaciated)



B. Heifer with BCS 5 (moderate)



C. Pig with BCS 3 (ideal)



D. Sheep with BCS 1 (emaciated)

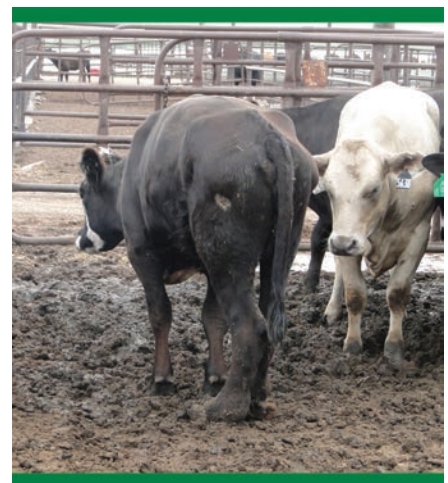
Answers are found in the appendix.

Importance of Lameness Evaluation

Animals are removed from herds/flocks due to lameness caused by a number of illnesses and conditions. However, transporting animals with severe lameness to slaughter is not recommended as they will often become non-ambulatory*. After reaching the abattoir**, any animal that cannot walk off of the trailer will not be accepted for slaughter and must be euthanized on the trailer. This situation is severely detrimental to the animal's welfare, and results in lost income and time for the producer. The following sections explain how to evaluate lameness and assign a score, describe conditions that affect animal mobility, and the appropriate action that should be taken for each condition.

*Non-ambulatory livestock that cannot rise from a recumbent position or that cannot walk, including, but not limited to, those with broken appendages, severed tendons or ligaments, nerve paralysis, fractured vertebral column, or metabolic conditions.

**Abattoir is a slaughterhouse.



Fractures that Impair Mobility

Animals can suffer broken bones due to a variety of causes. Fractures to the spine, pelvis, or legs will cause the animal a great deal of pain and could hinder the animal's use of one or more legs. Any livestock animal that cannot stand on all four legs should either be treated until it recovers full use of the leg, or euthanized on the farm.

Broken bones of the jaw or tailhead should not prevent the transport of an animal to slaughter. However, special provisions should be given to these animals during transport. Segregating the animal to the back of the trailer and providing extra bedding will lower the probability of further injury and provide for a more comfortable ride.

Conditions Causing Lameness

Arthritis

The inflammation of a joint can cause an animal to become immobile. However, if discovered early enough, the animal can be treated or sent to slaughter before the condition worsens. Food producing animals suffering from arthritis in multiple joints as a pathologic sequela from a systemic disease will be condemned at slaughter and should not be transported. Joint inflammation of this severity requires either treatment with prevention of transportation until the arthritis has subsided, or euthanasia.

Joint or Sole Abscesses

Localized collections of pus can occur in many animals and may cause extreme discomfort that inhibits the animal's ability to walk. Abscesses that cause lameness should be treated immediately.

Animals that display multiple abscesses should be treated and prevented from being sent to slaughter until all pharmacologic meat withdrawals are met. If the abscesses fail to resolve, it may be an indication that the animal has internal abscesses. If an animal has internal abscesses in multiple body compartments, the carcass will be condemned at slaughter. It is then recommended that this animal be euthanized on the farm.

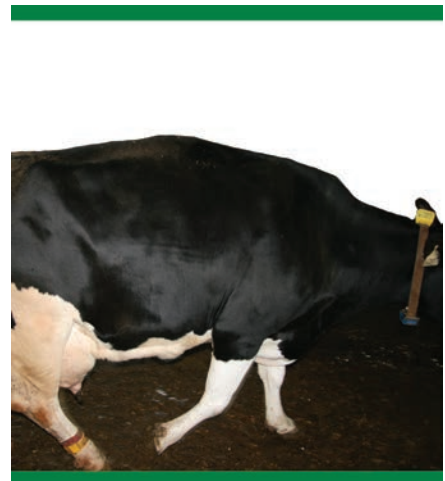


Lameness Evaluation

There are a number of physical conditions, hoof problems, and infections that can cause an animal to become lame. Due to the varying degrees of seriousness of these afflictions, it is difficult to suggest transportation limitations based solely on the disease. Rather, the evaluation of an animal's lameness, through the use of lameness scoring, is the most effective way to assess whether an animal is ambulatory for travel. The following scoring ranges should be consulted in order to determine the severity of an animal's lameness.

Ruminants Lameness Scores (range from 1 to 5)

1. The animal walks normally. There are no signs of lameness or uneven distribution of weight.
2. There are no evident signs of lameness, though the animal may walk with short, slightly uneven, strides. The animal's back may be flat when standing but arched when walking.
3. The animal shows an abnormal gait with short strides on one or more legs. The back is arched both when the animal is standing and walking. The head does not bob when walking. In most cases, it is difficult to tell which leg is affected.
4. The animal is obviously lame on one or more legs. An observer will in most cases be able to tell which leg is affected. The back will be arched during both standing and walking. The animal's head will bob when walking (pictured right).
5. The animal is obviously lame on one or more legs. The animal will not bear weight on the affected leg. The back is arched regardless of the animal's position. The animal will bob its head when walking.



Source:

- Thomsen P, Munksgaard L, Togersen F. Evaluation of a Lameness Scoring System for Dairy Cows. *Journal of Dairy Science* 2008;91:119-126.

Swine Lameness Scores (range from 0 to 5)

0. The pig displays even strides. The caudal part of the pig's body sways slightly while walking. The animal is able to accelerate and change direction quickly.
1. An abnormal stride length is present even though it may be difficult to detect this. The pig appears to walk with a stiff motion. The animal is still able to accelerate and change direction.
2. The pig walks with a shortened stride which is easily detectable. However, there is no hindrance to the pig's agility. The animal's caudal region still sways back and forth while walking.
3. The animal displays a shortened stride and is reluctant to put weight on the affected limb. The pig's caudal region still sways while walking, though the animal is incapable of trotting.
4. The pig refuses to put weight on its affected limb.
5. The animal refuses to move (pictured right).

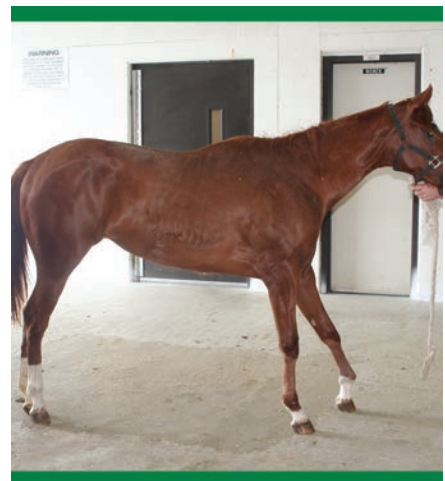


Source:

- Main D, Clegg J, Spatz A, et al. Repeatability of a lameness scoring system for finishing pigs. *Veterinary Record* 2000;147:574-576.

Equine Lameness Scores (range from 0 to 5)

0. Lameness is not perceptible under any circumstances.
1. Lameness is difficult to observe and is not consistently apparent, regardless of circumstances (e.g., under saddle, circling, inclines, hard surfaces etc.)
2. Lameness is difficult to observe at a walk or when trotting in a straight line but consistently apparent under certain circumstances (e.g. weight-carrying, circling, inclines, hard surfaces, etc.)
3. Lameness is consistently observable at a trot under all circumstances.
4. Lameness is obvious at a walk.
5. Lameness produces minimal weight bearing in motion and/or at rest or a complete inability to move (pictured right).



Source:

- *Lameness Exams: Evaluating the Lam Horse. American Association of Equine Practitioners: Bayer Health Care.* http://www.aaep.org/health_articles_view.php?id=280

Transportation Based Upon Lameness Scoring

After assessing an animal's mobility by using lameness scoring, decisions need to be made on what lameness scores will or will not allow for transport.

Ruminants

Cattle, sheep and goats displaying lameness scores of 4 or 5 should not be transported, unless it is for veterinary treatment. Ruminants exhibiting a lameness score of 3 may be transported but should be given extra bedding and segregated to the back of the trailer. Livestock that display a lameness score of 1 or 2 can be transported as normal. Any animal that requires assistance to rise should not be transported for commercial purposes.

Swine

Pigs with a lameness score of 4 or 5 should not be transported. Swine that display lameness scores of 1, 2, or 3 may be transported. However, these animals should be segregated and provided extra bedding if possible.

Equine

Horses exhibiting lameness scores of 4 or 5 should not be transported unless it is for veterinary care. Any horse that is classified as having a lameness score of 3 should be loaded in the back of the trailer and provided additional bedding.

Horses displaying lameness characteristics of 1 or 2 can be transported as normal.

Knowledge Review #3

You are presented with three dairy cows that are being shipped to a different state for slaughter. The cows have the following body conditions:

Animal 1 - The pelvic bones and spinous processes of vertebrae are defined. Palpation of the short ribs reveals some fat build up on these transverse processes. The anal area is somewhat recessed resulting in a slightly prominent vulva.

Animal 2 – The individual vertebrae of the spine, pelvic bones, and ribs are all prominently seen. Vulva is prominent, as the anal area is receded. There is no detectable fat on this animal.

Animal 3 – Pelvic bones are indiscernible. The thighs curve out and there are discernible fat deposits over the ribs and tailhead. The brisket and flanks appear to be full and heavy.

Which of the following is true based on the body condition information presented?

- A.** Animal 1 is unfit to travel
- B.** Animal 2 is unfit to travel
- C.** Animal 3 is unfit to travel
- D.** All animals are unfit to travel
- E.** All animals are fit to travel

Answers are found in the appendix.

Infectious Diseases

As a review of your accredited duties, from 9CFR161.4 (f) “An accredited veterinarian shall immediately report to the Veterinarian-in-Charge and the State Animal Health Official all diagnosed or suspected cases of a communicable animal disease for which a APHIS has a control or eradication program in 9 CFR chapter I, and all diagnosed or suspected cases of any animal disease not known to exist in the United States as provided by §71.3(b) of this chapter.”

9CFR Chapter I lists the livestock control and eradication programs applicable to the species addressed in this module which includes tuberculosis, brucellosis, pseudorabies, and scrapie. Likewise, applicable communicable diseases that constitute an emergency or threaten the health of U.S. livestock include foot-and-mouth disease, rinderpest, and contagious pleuropneumonia.

9CFR71.3 “Interstate movement of disease animals and poultry generally prohibited” lists diseases by species as well as other situations precluding transport. In general, accredited veterinarians, and those involved in livestock production, from the animal’s owner to the slaughter facility proprietor “are required to exercise reasonable diligence to ascertain whether such animals or poultry are affected with any contagious, infectious, or communicable disease, or have been exposed to the contagion or infection of any such disease” either through direct contact or through fomites such as housing facilities, transport vehicles or premises that contained diseased animals. Therefore, in order to prevent the spread of infectious disease, any animal that is reasonably suspected to be infected with a disease should not be transported. The full language for each of the CFR statements can be found at the URLs provided below.

9CFR161: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=d8f5721103ae2566b4f18f3a6af2846e&tpl=/ecfrbrowse/Title09/9cfr161_main_02.tpl

9CFR Chapter I: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title09/9cfrv1_02.tpl

9CFR71.3: <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=052e29a6a3641db30c47ff4bb732c479&rgn=div8&view=text&node=9:1.0.1.3.16.0.37.3&idno=9>

Fever

An elevated body temperature due to an immune system response is one of the tell-tale signs of infectious disease or heat stroke. Animals exhibiting a fever should be delayed from travel and evaluated for treatment. FSIS condemns livestock exhibiting pyrexia per 9 CFR 309.3(c). After resolution of the fever and no outward signs of a contagious or communicable disease, the animal can be deemed fit for travel. Transport of the animal for veterinary treatment is permissible providing that the animal is transported alone and in a well-bedded and appropriately ventilated trailer.

Livestock with measured temperatures above those listed below should not be transported:

- Bovine: 102.5°F (39°C)
- Small Ruminants: 103.3°F (39.6°C)
- Swine: 103°F (39.5°C)
- Equine: 101.5°F (38.6°C)

Sources:

- *Bovine & Small Ruminants – Caring for Compromised Cattle: Ontario Farm Animal Council, 2006.* <http://www.ofac.org/pdf/CompromisedCattlefinal.pdf>
- *Swine – Caring for Compromised Pigs: Ontario Farm Animal Council, 2010.* <http://www.ofac.org/pdf/Caring%20for%20Compromised%20Pigs%20July%202010.pdf>
- *Equine - Epsy, B. How Do I Take My Horses Temperature? General Health, American Association of Equine Practitioners, 2011.* http://www.aaep.org/health_articles_view.php?id=365

Hernias

The protrusion of an organ out of the abdominal cavity and through an opening in the body wall can become a serious problem if the protruding organ becomes strangulated. Hernias may also create other problems such as difficulty when walking or splitting of the skin due to a buildup of pressure.

Bovine

Calves may suffer umbilical hernias if the umbilical ring fails to close. Cattle suffering from this condition should be transported to slaughter as soon as they reach market weight. However, if the hernia progresses to the point where it is causing the animal to lose body condition and/or is impeding the ability of the cow to walk, then the animal should be euthanized on the farm.

Swine

Many hernias are easily treatable in younger pigs. However, animals that display untreated hernias should be segregated from other pigs. If swine exhibit a hernia that impedes their ability to walk or touches the ground, then the affected pig should be euthanized immediately. Pigs that exhibit hernias which do not impede movement or touch the ground should be sent to slaughter as soon as they reach market weight.

Equine

Horses can also suffer from large hernias that touch the leg of the horse when walking, are painful to the touch, or cause a splitting skin wound. Animals suffering from hernias of this magnitude should only be transported for veterinary treatment. If the hernia cannot be treated, then euthanasia is necessary.



Physical Conditions by Body System Precluding Transport

There are several physical conditions that will prevent the transport of an affected animal. Conditions have been classified by their affected body system. The following will be covered:

- Reproductive System
- Cardiovascular System
- Respiratory System
- Digestive System
- Integumentary System
- Central Nervous System

Reproductive System - Females

Uterine Prolapse and Eversion

The protrusion of the uterus outside of the body presents a very painful and life-threatening situation for female animals as pictured right.

All Livestock: Affected animals should only be transported for veterinary treatment.

Vaginal Prolapse

A protrusion of the vagina outside of the body cavity puts the vagina at a high risk for infection. Animals suffering from this condition may be transported for veterinary care.

Ruminants: If possible, treatment is suggested as the best possible course of action. However, animals suffering from a vaginal prolapse may be transported directly to the abattoir or a veterinary facility for treatment.

Swine: Sows or gilts that suffer a prolapse of the vagina should be immediately separated from other pigs to prevent cannibalization. Animals with prolapsed vaginas should either be immediately treated or transported to slaughter. Delaying treatment or transport can result in a severe infection of the vagina. If the infection becomes untreatable, then the animal should be immediately euthanized.



Reproductive System - Males

Penis Injury

A rupture of the blood vessels of the penis resulting in bruising, swelling, and a broken penis.

Bovine: Bulls suffering from a broken penis should be loaded into a separate compartment and transported to the nearest abattoir or veterinary facility for treatment.

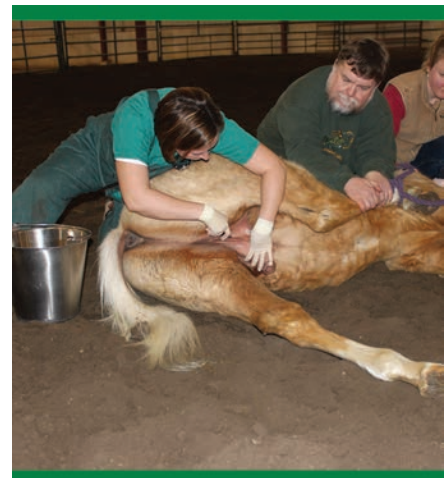
Small Ruminants: Urethral blockages of goats and sheep are quite common and are treatable. However, should a case of urethral blockage be untreatable, then the animal should be transported in a separate compartment to the nearest slaughterhouse.

Castration

The traumatic nature of castration causes a stressful situation for the animal, inflammation of the scrotum, and an open wound susceptible to infection for a period of time.

Bovine: Cattle are castrated at varying ages and by a number of different methods, most of which result in an open wound that needs to completely heal before transporting the animal to slaughter or long distances. For cattle castrated at a veterinary facility and traveling a short distance to their home facility, before being loaded onto a clean trailer, all evidence of hemorrhaging from the scrotum should cease.

Swine: Boars should not be marketed immediately following castration. The animal should be allowed three to four weeks to reduce inflammation and for the incision to heal.



Equine: The surgical site should be completely healed and aggressive behavior reduced before transporting long distances or to slaughter so as to minimize discomfort, stress, and the risk of infection. Regulations written for horses intended for slaughter yet applicable to all horses include 9CFR88.4 (ii) "Each stallion and any aggressive equines are completely segregated so that no stallion or aggressive equine can come into contact with any other equine on the conveyance". Since horses may be anesthetized for the castration

procedure, before returning to a stable from a veterinary facility, at a minimum, the horse should be ambulatory and not actively bleeding from the surgical site.

Cardiovascular System

Congestive Heart Failure

Animals that exhibit engorged jugular veins, thoracic and possibly abdominal edema, and an unwillingness to move most often have a case of congestive heart failure.

All Animals: Livestock that suffer from congestive heart failure should not be moved and should be euthanized on farm.

Traumatic Reticuloenteritis (hardware disease)

Bovine: Due to the indiscriminate feeding nature of cows, they may ingest sharp objects that can puncture the cow's reticulum. This perforation allows ingesta and bacteria to leak out into the peritoneal cavity. Peritonitis is the result of this and often leads to the development of adhesions in the abdomen. Cows may present with rumenoreticular atony, a sharp fall in milk production, and abdominal pain. It is recommended that animals suffering from this condition either be treated or transported to slaughter as soon as possible.

Respiratory System

Pneumonia

Livestock that suffer from labored breathing due to an infection of the lower respiratory tract are immunocompromised and transportation of any type will only exacerbate this condition. However, transportation for veterinary care is acceptable, though steps should be taken to reduce the amount of stress that the animal experiences during travel.

All Animals: Animals affected with pneumonia should be treated immediately, and if they are scheduled to undergo transportation, for sale or slaughter, this should be delayed until their condition improves. Following recovery, and the appropriate medication withdrawal time*, livestock may be transported, in a separate trailer compartment.

*Withdrawal time consideration is very important when medicating, vaccinating, or supplementing livestock. Withdrawal time is the time that it takes for residues from substances introduced into the animal's system to fall below acceptable set levels so that the meat/milk from the animal can be safely consumed by humans. These times have been published for many common pharmaceuticals and biologicals in food animal production. For further information visit the Food Animal Residue Avoidance Databank (FARAD) website at: <http://www.farad.org/>

Digestive System

Displaced Abomasum (DA)

The relocation of the fourth stomach to either the right or left side of the ruminant's abdomen can result in abomasal volvulus and ketosis.

Bovine: Dairy cows are extremely susceptible to suffering DAs, especially following parturition. If a cow has a DA, it should not be transported to an auction. These animals should either be treated appropriately by a veterinarian or loaded in a separate trailer compartment and sent to slaughter.



Prolapsed Rectum

The protrusion of the rectum outside of the body can cause severe pain and an area highly susceptible to infection as pictured right.

All Animals: Like a vaginal prolapse, animals suffering from a prolapsed rectum should either be treated or sent to slaughter before the prolapse becomes infected or lacerated.

Rectal Stricture

This is caused by numerous maladies (listed below by species) that result in scarring and subsequent narrowing of the rectum, triggering fecal material to back up in the intestines.

All Animals: Livestock suffering from rectal stricture should be transported to slaughter before their condition worsens. If the animal becomes bloated and the body condition is depleted, the animal should be euthanized on the farm.

Bovine: Rectal strictures found in cattle are commonly caused by neoplasia, trauma, or fat necrosis encroaching on the intestinal lumen.

Swine: Stricture of the rectum will often occur due to inflammation of the colon and small intestine, scarring following a rectal prolapse, or as a sequela of ulcerative proctitis.

Integumentary System

Wounds

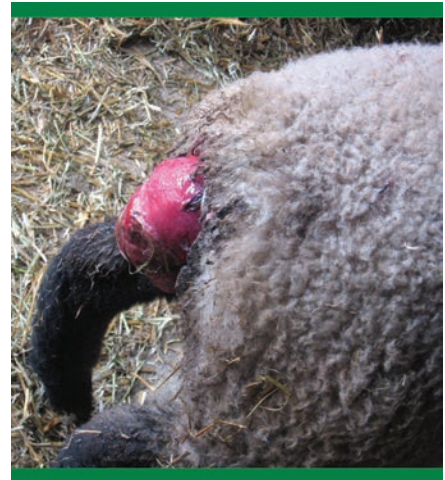
The division of skin and underlying tissue, due to an external force, that results in the loss of blood and provides an environment for infection to occur. All cuts and wounds should be monitored and treated.

Ruminants: Animals suffering from large wounds may be transported to slaughter, provided that loading does not cause the animal excess pain and is not actively bleeding. If the animal is caused undue pain due to loading, it should be euthanized. Livestock may also undergo transport to receive veterinary care.

Swine: Animals suffering from small to medium sized wounds (can freely move and not in severe pain) should be removed from group-housed pens. These pigs should be treated and finished in an individual hospital pen, then transported in a separate compartment in the trailer. Pigs that sustain large, severely painful wounds making it difficult to move due to the injury should be separated, treated, and then sent to slaughter as soon as possible. If the animal is in too much pain to travel, then it should be euthanized.

Tail-bitten pigs: The biting of tails is a seemingly minor issue but animals should be segregated and treated immediately to minimize spinal cord infection and abscesses. If treatment is not an option, the pig should be sent to slaughter as soon as possible. Animals that suffer tail-bites resulting in large tail wounds, severe pain, and/or hind-leg ataxia should be euthanized on the farm.

Equine: Horses that suffer wounds during, or prior to, transport should be treated immediately. If the wound affects joints, tendons, ligaments, or other areas that may impede locomotion, the animal should only be transported with proper support and protection to obtain veterinary treatment. A horse that is suffering from a wound which causes the animal undue pain when loading should not be transported. All minor wounds should be treated appropriately and the animal may be transported.



Actinomycosis

Livestock that suffer from actinomycosis may display a variety of symptoms in various anatomical locations. Examples for different livestock species are listed below:

Lumpy Jaw: Bacterial invasion (*Actinomyces bovis*) of wounds in the upper or lower jaw of ruminants result in the accumulation of granular pus in a hard lump. This lump can rupture and disrupt normal chewing. Cows that suffer from lumpy jaw should be promptly transported to slaughter.

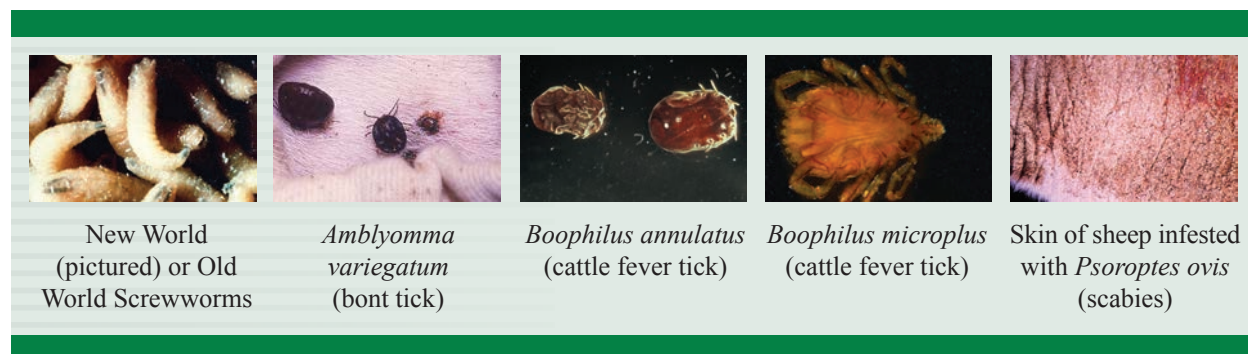
Fistulous Withers: The inflammation, and possible rupture, of a horse's supraspinous and/or supra-atlantal bursa is often caused by a *Brucella* sp. infection or actinomycosis. Horses that suffer from fistulous withers should be treated and regulated as though they suffer from a *Brucella* infection, requiring notification of the State and Federal Animal Health Officials. Given the zoonotic nature of *Brucella* sp., clients should be advised of the disease risk and to contact their physician if exposure occurs.

9 CFR 311.9, 'Actinomycosis and actinobacillosis' provides information on disposition of animals with these lesions.

External Parasites

Livestock that are infested with lice, mites or ticks should not be transported, as this could lead to the spread of these parasitic vectors and thus the possible spread of disease.

If an animal is suspected of being infested with any of the following parasites, prompt notification of the State and Federal animal health authority is imperative:



Nervous System

Diseases of the nervous system are often serious and potentially dangerous to both animal caretakers and veterinarians. Disorders such as rabies (all mammals) and bovine spongiform encephalopathy (BSE in cattle) can pose serious risks to both animal and human health. Livestock that display abnormal behaviors (listed below) should be evaluated carefully to assess the animal's ability to be safely transported. If the animal or those handling it could experience bodily harm during loading or unloading, the animal should not be transported. If these behaviors persist, and treatment is of no avail, then the animals should be euthanized. Some diseases require notification of the State and Federal animal health authority. Familiarize yourself with the reportable diseases in your state and the OIE Listed Diseases available at: <http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2011/>.

The following animal behaviors and signs of disease warrant monitoring, further diagnostics, and possible euthanasia if treatment is not an option:

- Head pressing
- Ataxia
- Constant circling
- Fixed staring gaze
- Hypersalivation
- Hyperexcitability (priapism)
- Facial tremors
- Limb paralysis
- Low head carriage
- Head tossing
- Teeth grinding
- Hypermetria
- Self-mutilation

Knowledge Review #4

You are called out to examine a 225 pound (102 kilograms) barrow at a small farrow-to-finish operation. The pig displays a dry cough with occasional “flare-ups” when it is roused. The pig’s temperature registers at 102°F (38.9°C). You diagnose pneumonia. The farmer would like to send the pig to slaughter as soon as possible.

What should be done?

- A.** The animal should be sent to slaughter immediately
- B.** The animal should be treated and then transported to slaughter in a separate trailer compartment when its condition improves, following the recommended withdrawal for any medications
- C.** The animal should be treated and then sent to slaughter with cull sows following the recommended withdrawal for any antibiotics
- D.** The animal should be euthanized as there is no hope for its recovery from this condition

Answers are found in the appendix.

Transportation Assessment

The assessment of an animal’s fitness for travel includes more than just the visual and physical examination of the animal. Accredited veterinarians should be familiar with practical travel provisions that can be implemented to enhance livestock transport. The following section discusses improvements that can be put into practice to improve both the safety and welfare of livestock during travel.

- Trailer – Physically enhancing the trailer’s accommodations
- Loading – Separating certain animals, spacing within the trailer, and proper footing
- Driving – Decreasing the stressors on livestock during travel

Conducting a Trailer Assessment

Cleanliness

It is a good management practice to clean out trailers such that they are free of manure before a new group of livestock enter for transport. A clean trailer will reduce the spread of disease, decrease the smell of previous livestock groups which tend to make livestock uneasy, and prevent slippery conditions caused by excess manure.

Flooring

The floor of a trailer should always be thoroughly inspected prior to loading to ensure it is in good condition and made of sturdy material. Wooden floors tend to rot over time and wear through. The acid in manure can cause aluminum to oxidize and fatigue. Animals can become severely injured if a leg or more falls through while in transit.

Proper traction is a very important issue when assessing flooring. Trailers that lack proper footing increase the chances of livestock slipping or falling, and thus becoming non-ambulatory. Apart from having a floor that is free of manure, trailers should either have metal grating or rubber mats that allow for appropriate traction. However, it is important to monitor metal grating to make sure that it has not broken as this can result in puncture wounds in animal’s feet.



Sidewalls, Separators, and Roof

Inspect the walls, separator gates/doors, and roof of the livestock trailer to ensure there are no protruding parts that could injure an animal while in transport. Welded metal and supports can degrade over time and become loose or sharp. Separator gates/doors should swing freely and securely latch to prevent opening during travel. Gaps in walls or gates/doors should be small enough to prevent an animal's head or foot getting lodged in transit.

Weather Protection

Since an animal's well-being during travel can be affected by the weather conditions, vehicle modifications may be needed to mitigate hazardous conditions.

- Trailers should be modified to adapt to changing weather conditions. For example, trailers should be modified for wind protection* during cold weather and adjusted to allow for greater air flow** during hot weather.
- It is important that trailers used for the transport of pigs have a covering to protect swine from sunburn.
- Open-topped trailers should be fitted with a covering when transporting animals in inclement weather.

*Wind protection – In cold weather, side panels should be secured over air spaces towards the front of the trailer. This will cut down on cold air movement through the trailer and prevent animals from becoming too cold during travel.

**Greater air flow – Hot weather requires greater air flow to prevent animals from becoming overheated. All air spaces should be uncovered, and open-topped trailers should be utilized if the weather is appropriate. Some newer trailers even have the option of an air flow system which helps to circulate air throughout the trailer.



Loading Assessment

Following assessment of the trailer, it is important to have a clear plan for loading animals. There are several rules that should be followed in order to ensure that animals are transported safely and with as little stress as possible.

- Loading animals onto a trailer can generally be made easier by using a ramp with proper traction, a low angle of incline, and a width that will not allow livestock to turn around.
- Species should not be intermixed within a trailer compartment.
- Livestock of the same species should be grouped in compartments with animals of similar weight.
- Animals should not be crowded into trailer compartments.
- Mature intact male livestock should be loaded in separate compartments within a trailer.
- Animals should not be loaded over non-ambulatory animals.



All of these provisions should be implemented during the loading of livestock as they will help to prevent overheating, aggression, and injuries from occurring during travel.

For more information on the appropriate loading densities for livestock, please refer to Appendix II of the "Transportation: Recommended code of practice for the care and handling of farm animals" document available at <http://www.nfacc.ca/pdf/english/Transportation2001.pdf>

For more information on animal handling, loading, and assessing a trailer, please refer to: Recommended Animal Handling Guidelines and Audit Guide: A Systematic Approach to Animal Welfare, compiled by Temple Grandin and the American Meat Institute Animal Welfare Committee, 2010 available at: <http://www.animalhandling.org/ht/a/GetDocumentAction/i/63215>

For more information on species specific animal welfare and codes of practice, including transport recommendations, please refer to the Animal Agriculture Alliance website at: http://www.animalagriculture.org/current/home.cfm?Category=Animal_Welfare&Section=Main

Driving Recommendations

Accredited veterinarians might not ever drive a trailer filled with livestock to an auction or an abattoir. However, it is important to understand the recommended general principles of livestock transportation.

- Weather conditions along the transportation route should be checked before livestock are loaded. This will allow for adjustments to be made to the trailer and will prevent the transport of animals in hazardous weather conditions.
- It is important that the route of travel be planned out before the transporter begins to pull away from the loading dock. Pre-planned routes should be free of construction and other delays as these will increase the time livestock spend without food and water.
- All paperwork needed for transit should be in the driver's possession before embarking on the trip.
- Transporters should use extra care to drive with as few abrupt starts and stops as possible. This is especially important within the first two hours of travel, as livestock acclimatize to the new movements and vibrations of the truck and trailer. Additionally, curves should be taken with extra caution. Driving considerations are especially important when transporting pigs, as they are sensitive to motion sickness.
- Livestock should be checked for signs of discomfort two hours into the trip, and then every four hours following that. All of the driver's rest periods should be as brief as possible, as animals spend this time on the trailer with little to no air flow, as well as no food or water. Animals should not be exposed to conditions that may cause heat or cold stress.

Signs of discomfort in livestock due to heat stress/overcrowding:

- » Animals will not settle, tend to scramble for footing, and are continuously noisy
- » Livestock may lie down and refuse to get back up
- » Animals pant or breathe open-mouthed
- » Horses become wet during hot weather transport

Signs of discomfort in livestock due to cold stress:

- » Animals begin eating available bedding
- » Fluids are frozen to the nose and face of the animal
- » Horses and cattle shiver
- » Pigs display skin discoloration and a reluctance to move



Refer to the ruminant chart in the appendix to determine if the weather is advisable to transport livestock in. As discussed under “Age Recommendations”, calves require special care during transport to ensure they do not become too cold (environmental temperatures below 60°F/15.6°C) and remain dry. A wet calf has the same effect as the outdoor temperature dropping 40-50°F (4-10°C).

Source:

- Grandin, Temple and American Meat Institute Animal Welfare Committee. *Recommended Animal Handling Guidelines and Audit Guide: A Systematic Approach to Animal Welfare*. American Meat Institute. 2010;6-7. <http://www.animalhandling.org/ht/a/GetDocumentAction/i/63215>

For swine, there are detailed recommendations in the Transportation Quality Assurance document produced by the National Pork Board, 2008 available at: <http://www.pork.org/filelibrary/TQA/TQAEExtremeWeather.pdf>

Feed and Rest Requirements during Transport

Title 49 of the U.S. Code, Chapter 805, Section 80502 (Transportation of Animals), commonly referred to as the “Twenty-eight Hour Law” provides the regulations on transportation and resting requirements for animals in transit. Under this U.S. law, an animal(s) cannot be transported by “a rail carrier, express carrier, or common carrier (except by air or water)” for more than 28 consecutive hours without unloading the animals for food, water, and rest. Time spent loading and unloading the animals is not counted as confinement. This law does not apply when animals are transported in a vehicle or vessel in which they have food, water, space, and an opportunity for rest.

An exception to this law applies to sheep. They can remain confined an additional 8 consecutive hours if the 28-hour period of confinement ends at night.

Exceptions may also be made when the animals cannot be unloaded because of unforeseen and unavoidable causes or when the owner submits a written request to extend the period to 36 hours.

Rest periods should last a minimum of five consecutive hours. However, horses transported to slaughter must be allowed a minimum of six consecutive hours for eating, drinking, and resting before they are loaded for transport as set forth in the Code of Federal Regulations, title 9, part 88 (Commercial Transportation of Equines for Slaughter).

For more details on the feeding and resting requirements for transporting livestock, refer to 9CFR Part 89 Statement of Policy under the Twenty-eight Hour Law at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=9e65b137431b719163f410e530f31472&tpl=/ecfrbrowse/Title09/9cfr89_main_02.tpl

Knowledge Review #5

Various methods and trailer improvements will enhance an animal's well-being when undergoing transport. Select ALL that apply.

- A.** Non-slip trailer flooring
- B.** A high-angled ramp
- C.** Open-topped trailers to transport pigs during the summer
- D.** Careful driving that avoids making unnecessary abrupt starts or stops
- E.** Long driver rest periods during the trip
- F.** Extra insulative bedding during cold temperature transport

Answers are found in the appendix.

Summary

Now that you have completed this module you should be able to describe the role of the accredited veterinarian when assessing livestock's fitness to travel. You should also be able to describe how to perform an inspection or examination of an animal, as well as understand the appropriate travel limitations based upon the corresponding condition. Finally, it is important that you are aware of steps that can be taken to make transportation safer and more comfortable for livestock. Remember, animals with (or in) any condition, except for late term pregnancy or a foreign animal disease, may be transported for veterinary treatment if warranted.

Resources

Throughout this module you were provided with supplementary information and links to additional resources. That information is repeated here for your reference.

Animal Agriculture Alliance, Animal Welfare and Codes of Practice http://www.animalagalliance.org/current/home.cfm?Category=Animal_Welfare&Section=Main

Alberta Equine Welfare Group, Humane Handling Guidelines for the Care of Unfit Animals <http://www.afac.ab.ca/careinfo/guidelines/080708horse.pdf>

Canadian Agri-Food Research Council, Recommended Code of Practice for the Care and Handling of Farm Animals: Transportation <http://www.nfacc.ca/pdf/english/Transportation2001.pdf>

Grandin, Temple and American Meat Institute Animal Welfare Committee. Recommended Animal Handling Guidelines and Audit Guide: A Systematic Approach to Animal Welfare. American Meat Institute. 2010 <http://www.animalhandling.org/ht/a/GetDocumentAction/i/63215>



National Pork Board, Transportation Quality Assurance (2008) <http://www.pork.org/filelibrary/TQA/TQAExtremeWeather.pdf>

Ontario Farm Animal Council, Caring for Compromised Cattle
<http://www.ofac.org/pdf/CompromisedCattlefinal.pdf>

Ontario Farm Animal Council, Caring for Compromised Pigs
<http://www.ofac.org/pdf/Caring%20for%20Compromised%20Pigs%20July%202010.pdf>

Supplemental Training

The content in this module has been approved expressly to serve as one unit of supplemental training for participants in USDA's National Veterinary Accreditation Program. Please ensure you complete, sign, and retain the certificate that was issued with this document stating that you have read the contents of this module. This certificate will be your only proof of having completed this module, and will need to be provided to the appropriate official should APHIS audit your accreditation supplemental training records in the future. Contact your VS Area Office for more details on accreditation renewal.

Acknowledgments

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The content of this module has been reviewed and approved by USDA-APHIS Legislative and Public Affairs.

Photo and Illustration Credits

- Page 1** These photos represent examples of different modes of transportation used for livestock. The top photo shows two sheep in a trailer. The bottom photo shows Holsteins being loaded off a trailer and onto a ship. *Photo sources: Renee Dewell, Iowa State University (top), Tom Latta, Latta Veterinary Consulting (bottom)*
- Page 2** **(Top)** This photo shows a veterinarian examining a goat. *Photo source: Danelle Bickett-Weddle, Iowa State University*
(Bottom) This photo shows a calf with a dry naval and ambulatory, making it ready for transportation. *Photo source: Mark Kirkpatrick, Kuna, Idaho*
- Page 3** **(Top)** This photo shows a kid goat in a crate ready for transportation. *Photo source: Pam Zaabel, Iowa State University.*
(Bottom) This photo shows a sow with a full udder and swollen vulva. *Photo source: Megan Smith, Iowa State University*
- Page 4** **(Top)** This photo shows a horse undergoing a sight evaluation using gauze on a stick. *Photo source: Andrew Kingsbury, Iowa State University*
(Bottom) This photo shows a cow with ocular squamous cell carcinoma of the eyeball. *Photo source: William Swecker, Jr. DVM, PhD, DACVN VA-MD Regional College of Veterinary Medicine*
- Page 5** Knowledge Review 1: Images of animals that are or are not fit for travel. *Photo sources: A: Megan Smith, Iowa State University; B: Adrienne Herron, Mann-Herr Farms, Alberta, Canada; C: Pam Zaabel, Iowa State University; D: ISU-Veterinary Diagnostic and Production Animal Medicine*
- Page 6** Images of anatomical locations of key landmarks for livestock body condition evaluation. *Photo sources: Beef cow: Body Condition Scoring Beef Cattle, Mississippi State University Extension Service, 2008; Dairy cow: t; Small ruminants: Sheep Care Guide, American Sheep Industry Association, 2006; Swine: Assessing Sow Body Condition, Cooperative Extension Service, University of Kentucky College of Agriculture, 1999; Equine: Center for Equine Health, School of Veterinary Medicine, University of California, Davis*
- Page 7** Beef Cattle: Images of beef cattle body condition scores 1 to 9. *Photo source: Body Condition Scoring Beef Cattle, Mississippi State University Extension Service, 2008*
- Page 8** Dairy Cattle: Images of dairy cattle body condition scores 1 to 5. *Photo sources: <http://www.ofac.org/pdf/Body%20Condition%20Scoring%20for%20Dairy%20Cattle%20June%202010.pdf> (1,3); Megan Smith, Iowa State University (2,4,5)*
- Page 9** Small Ruminants: Images of small ruminant body condition scores 1 to 5. *Photo source: Sheep Care Guide, American Sheep Industry Association, 2006*
- Page 10** Swine: Images of swine body condition scores 1 to 5. *Photo source: Assessing Sow Body Condition, Cooperative Extension Service, University of Kentucky College of Agriculture, 1999*
- Page 11** Equine: Images of equine body condition scores 1, 3, 5, 7, 9. *Photo sources: Center for Equine Health, School of Veterinary Medicine, University of California, Davis (1,3,5,9); Andrew Kingsbury, Iowa State University (7)*
- Page 12** **(Top)** Knowledge Review 2: Images of animals that are or are not fit to travel. *Photo sources: A: Center for Equine Health, School of Veterinary Medicine, University of California, Davis; B: Danelle Bickett-Weddle, Iowa State University; C: Danelle Bickett-Weddle, Iowa State University; D: Daniel Morrical, Iowa State University*
(Bottom) This image shows a steer with a swollen foot causing lameness. *Photo source: Danelle Bickett-Weddle, Iowa State University*
- Page 13** **(Top)** This image shows a cow with an abscess near the hock joint as a result of a puncture wound. *Photo source: Tara Wellman, Iowa State University*
(Bottom) This image shows a dairy cow with a lameness score of four. *Photo source: Megan Smith, Iowa State University*
- Page 14** **(Top)** This image shows a pig with a lameness score of five. *Photo source: Locke Karriker, Iowa State University*
(Bottom) This image shows a horse with a lameness score of five. *Photo source: Jennifer Schleining, Iowa State University*
- Page 16** This photo shows a pig with a hernia. *Photo source: Alex Ramirez, Iowa State University*

- Page 17** *(Top)* This image shows a cow with a prolapsed uterus. *Photo source: Iturreria Martin, DVM, contributed to and used with permission from The Drost Project (www.drostproject.org)*
(Bottom) This image shows the castration of an anesthetized horse. *Photo source: Carolyn Hammer, North Dakota State University*
- Page 18** This photo shows sutures on a cow after her corrective displaced abomasum surgery. *Photo source: Jennifer Schleining, Iowa State University*
- Page 19** *(Top)* This image shows a sheep with a prolapsed rectum. *Photo source: Jessica Kennicker, Iowa State University*
(Bottom) This image shows a horse getting a support brace placed on its front leg. *Photo source: Arnold Goldman, Connecticut State Animal Response Team*
- Page 20** This graphic shows different reportable external parasites. *Graphic illustration by: Katlyn Harvey, Iowa State University. Photo sources: Foreign Animal Diseases "The Grey Book" United States Animal Health Association (Cochilomyia hominivorax), Plum Island Animal Disease Center (Amblyomma variegatum), Armed Forces Institute of Pathology (Boophilus annulatus), J. Ostojic, Iowa State University, College of Veterinary Medicine (Boophilus microplus), Dr. Harrington, Purdue University, Noah's Arkive (sheep skin)*
- Page 21** This graphic illustrates a livestock trailer, highlighting the floor which should be inspected before each use. *Graphic illustration by: Katlyn Harvey, Iowa State University*
- Page 22** *(Top)* This graphic illustrates a livestock trailer used to off-load pigs, highlighting the sidewalls, separators, and roof which should be inspected before each use. *Graphic illustration by: Katlyn Harvey, Iowa State University*
(Bottom) This image shows a ramp on a livestock trailer used to off-load pigs. *Photo source: Katlyn Harvey, Iowa State University*
- Page 23** This photo shows people observing pigs leave a trailer. *Photo source: Renee Dewell, Iowa State University*
- Page 24** This photo shows steers being loaded onto a livestock trailer. *Photo source: Renee Dewell, Iowa State University*

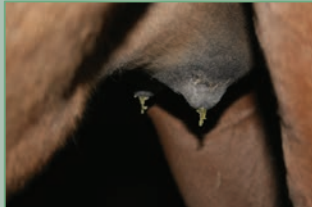
Knowledge Review Answers

Knowledge Review #1

Based on the photographs, select the pregnant animal that would be considered 'fit to travel' if she had no other abnormalities.



A. Springing heifer



B. Waxing udder on a mare



C. Goat with a newborn kid



D. A sow that is less than 50 days bred

The correct answer is D, the sow less than 50 days bred. Answers A, B and C are incorrect because the animals are displaying late stage signs of pregnancy. Transporting these animals may cause abortion or premature labor. These animals should be physically examined before undergoing transportation. If movement is necessary, ensure these animals travel in well-bedded trailers with adequate space that allows each animal to lie down comfortably.

Knowledge Review #2

Based on the photographs, select the animal(s) that would NOT be considered 'fit for travel' based on body condition score (BCS). Select ALL that apply.



A. Horse with BCS 1 (emaciated)



B. Sheep with BCS 3 (average)



C. Sheep with BCS 1 (emaciated)



D. Pig with BCS 3 (ideal)



E. Heifer with BCS 5 (moderate)

The correct answers are A and D as both animals are emaciated. Any animal exhibiting a body condition score of one is unfit for travel. The other animals exhibit acceptable body condition.

Knowledge Review #3

You are presented with three dairy cows that are being shipped to a different state for slaughter. The cows have the following body conditions:

Animal 1 - The pelvic bones and spinous processes of vertebrae are defined. Palpation of the short ribs reveals some fat build up on these transverse processes. The anal area is somewhat recessed resulting in a slightly prominent vulva.

Animal 2 – The individual vertebrae of the spine, pelvic bones, and ribs are all prominently seen. Vulva is prominent, as the anal area is receded. There is no detectable fat on this animal.

Animal 3 – Pelvic bones are indiscernible. The thighs curve out and there are discernible fat deposits over the ribs and tailhead. The brisket and flanks appear to be full and heavy.

Which of the following is true based on the body condition information presented?

- A. Animal 1 is unfit to travel
- B. Animal 2 is unfit to travel
- C. Animal 3 is unfit to travel
- D. All animals are unfit to travel
- E. All animals are fit to travel

The correct answer is B. Animal 2 lacks significant body fat and would be classified as emaciated and not fit for travel. This animal may be ill and in need of treatment. If the animal's condition does not improve, then it should be euthanized on farm. Animal 1 would be classified as thin (body condition score of 2) but still considered fit to travel. Animal 3 would be classified as fat (body condition score of 5), and also able to be transported.

Knowledge Review #4

You are called out to examine a 225 pound barrow (102 kilograms) at a small farrow-to-finish operation. The pig displays a dry cough with occasional “flare-ups” when it is roused. The pig's temperature registers at 102°F (38.9°C). You diagnose pneumonia. The farmer would like to send the pig to slaughter as soon as possible.

What should be done?

- A. The animal should be sent to slaughter immediately
- B. The animal should be treated and then transported to slaughter in a separate trailer compartment when its condition improves, following the recommended withdrawal for any medications
- C. The animal should be treated and then sent to slaughter with cull sows following the recommended withdrawal for any antibiotics
- D. The animal should be euthanized as there is no hope for its recovery from this condition

The correct answer is B. Animals suffering from pneumonia are at a severe risk of exacerbating their condition if put into a stressful situation like transportation. Therefore, the animal should be treated and allowed time to recover. Following recovery and medication withdrawal times, the animal should be transported in a separate compartment of the trailer so as to decrease stress and prevent a life-threatening flare-up of the disease.

Knowledge Review #5

Various methods and trailer improvements will enhance an animal's well-being when undergoing transport. Select ALL that apply.

- A.** Non-slip trailer flooring
- B.** A high-angled ramp
- C.** Open-topped trailers to transport pigs during the summer
- D.** Careful driving that avoids making unnecessary abrupt starts or stops
- E.** Long driver rest periods during the trip
- F.** Extra insulative bedding during cold temperature transport

Answers A, D, and F are correct. Non-slip flooring allows for better traction and prevents lameness injuries. Careful driving helps prevent motion sickness. Insulative bedding allows animals to stay warmer during transport in cold temperatures.

Answers B, C, and E are incorrect, as ramps should have a low angle with traction making it easier to climb. Open-topped trailers should not be used for pigs in the summer as their skin burns easily. Drivers should try to limit the frequency and time of rest periods that they take when transporting animals as these increase the time animals go without food and water.

Temperature and Humidity Charts for Ruminants

Tables taken, with permission, from: Master Cattle Transporter Guide. Texas Beef Quality Assurance.

| High Temperature °F | | Heat Index (HI) | | | | | | | | | | | | | | | | | |
|---------------------|----|-----------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RH | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| 90 | 91 | 95 | 98 | 102 | 105 | 109 | 113 | 117 | 122 | 126 | 131 | 136 | 141 | 147 | 152 | 158 | 164 | 170 | 176 |
| 85 | 90 | 93 | 96 | 99 | 102 | 106 | 110 | 113 | 117 | 122 | 126 | 130 | 135 | 140 | 145 | 150 | 155 | 161 | 167 |
| 80 | 89 | 91 | 94 | 97 | 100 | 103 | 106 | 110 | 113 | 117 | 121 | 125 | 129 | 134 | 138 | 143 | 148 | 153 | 158 |
| 75 | 88 | 90 | 92 | 95 | 97 | 100 | 103 | 106 | 109 | 113 | 116 | 120 | 124 | 128 | 132 | 136 | 141 | 145 | 150 |
| 70 | 86 | 88 | 90 | 93 | 95 | 98 | 100 | 103 | 106 | 109 | 112 | 116 | 119 | 123 | 126 | 130 | 134 | 138 | 143 |
| 65 | 85 | 87 | 89 | 91 | 93 | 95 | 98 | 100 | 103 | 105 | 108 | 111 | 114 | 118 | 121 | 125 | 128 | 132 | 136 |
| 60 | 84 | 86 | 88 | 89 | 91 | 93 | 95 | 97 | 100 | 102 | 105 | 107 | 110 | 113 | 116 | 119 | 123 | 126 | 129 |
| 55 | 84 | 85 | 86 | 88 | 89 | 91 | 93 | 95 | 97 | 99 | 101 | 104 | 106 | 109 | 112 | 114 | 117 | 120 | 124 |
| 50 | 83 | 84 | 85 | 86 | 88 | 89 | 91 | 93 | 95 | 97 | 99 | 101 | 103 | 105 | 108 | 110 | 113 | 115 | 118 |
| 45 | 82 | 83 | 84 | 85 | 87 | 88 | 89 | 91 | 92 | 94 | 96 | 98 | 100 | 102 | 104 | 106 | 109 | 111 | 114 |
| 40 | 81 | 82 | 83 | 84 | 85 | 87 | 88 | 89 | 91 | 92 | 94 | 95 | 97 | 99 | 101 | 103 | 105 | 107 | 109 |
| 35 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 92 | 93 | 95 | 96 | 98 | 100 | 102 | 104 | 106 |
| 30 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 92 | 93 | 94 | 96 | 97 | 99 | 101 | 102 |
| 25 | 80 | 81 | 82 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 93 | 94 | 95 | 97 | 98 | 100 |

RH = Relative Humidity

*Orange colored boxes indicate conditions in which the transport of livestock may be hazardous to the health of the animals undergoing transportation.

| Low Temperature °F | | Wind Chill Index (WCI) | | | | | | | | | | | | | | | | | |
|--------------------|-----|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| Wind Speed | -10 | -8 | -6 | -4 | -2 | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 |
| 25 | -59 | -56 | -53 | -50 | -47 | -44 | -41 | -38 | -35 | -32 | -29 | -26 | -23 | -20 | -17 | -14 | -12 | -9 | -6 |
| 23 | -57 | -54 | -51 | -48 | -45 | -42 | -39 | -36 | -33 | -30 | -28 | -25 | -22 | -19 | -16 | -13 | -10 | -7 | -4 |
| 21 | -54 | -51 | -49 | -46 | -43 | -40 | -37 | -34 | -31 | -28 | -26 | -23 | -20 | -17 | -14 | -11 | -8 | -5 | -3 |
| 19 | -52 | -49 | -46 | -43 | -40 | -37 | -35 | -32 | -29 | -26 | -23 | -21 | -18 | -15 | -12 | -9 | -6 | -4 | -1 |
| 17 | -48 | -46 | -43 | -40 | -37 | -35 | -32 | -29 | -26 | -24 | -21 | -18 | -15 | -13 | -10 | -7 | -4 | -2 | 1 |
| 15 | -45 | -42 | -39 | -37 | -34 | -31 | -29 | -26 | -23 | -21 | -18 | -15 | -13 | -10 | -7 | -5 | -2 | 1 | 4 |
| 13 | -41 | -38 | -36 | -33 | -30 | -28 | -25 | -23 | -20 | -17 | -15 | -12 | -9 | -7 | -4 | -2 | 1 | 4 | 6 |
| 11 | -36 | -33 | -31 | -28 | -26 | -23 | -21 | -18 | -16 | -13 | -11 | -8 | -6 | -3 | -1 | 2 | 4 | 7 | 9 |
| 9 | -30 | -28 | -26 | -23 | -21 | -18 | -16 | -14 | -11 | -9 | -6 | -4 | -2 | 1 | 3 | 6 | 8 | 10 | 13 |
| 7 | -24 | -21 | -19 | -17 | -15 | -12 | -10 | -8 | -5 | -3 | -1 | 1 | 4 | 6 | 8 | 10 | 13 | 15 | 17 |
| 5 | -15 | -13 | -11 | -9 | -7 | -5 | -3 | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 21 | 23 |
| 3 | -4 | -2 | 0 | 2 | 4 | 6 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 22 | 24 | 26 | 28 | 30 |

*Blue colored boxes indicate conditions in which the transport of livestock may be hazardous to the health of the animals undergoing transportation.

Full text of Master Cattle Transporter Guide can be found at:

<http://animalscience.tamu.edu/ansc/mastercattletransporter/new/PDF/entire-guide.pdf>